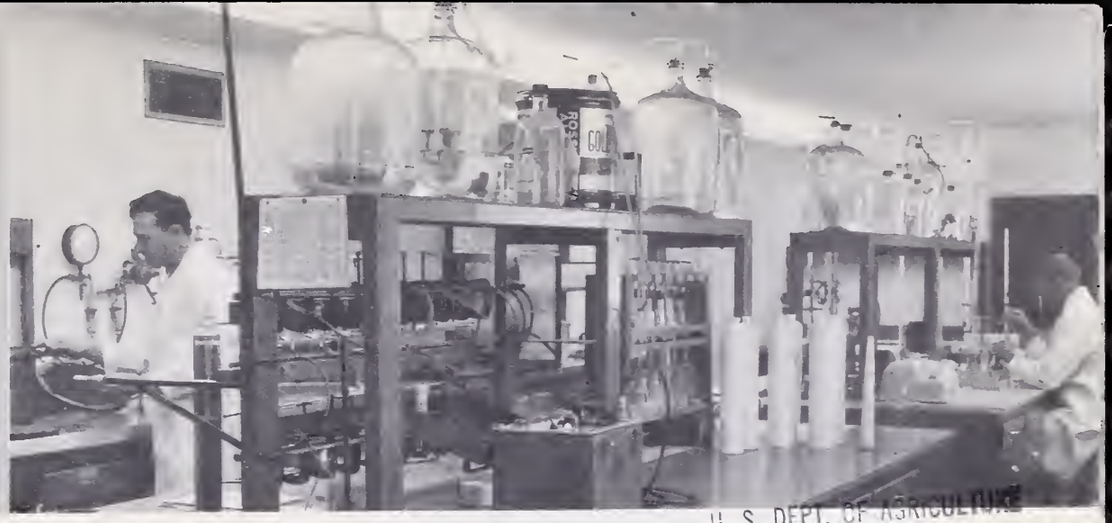
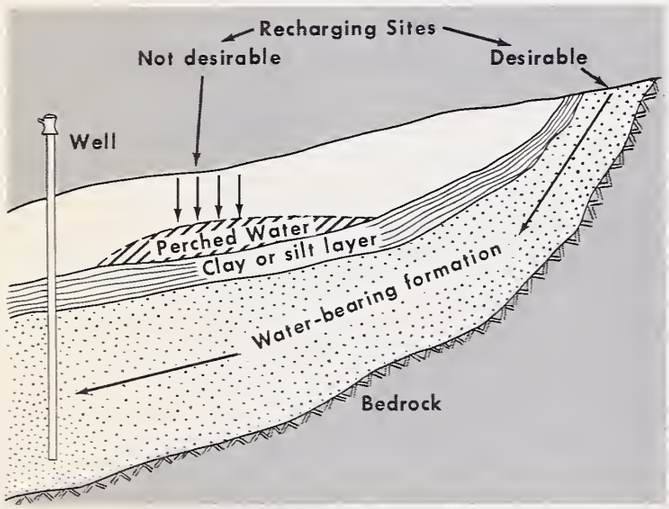
Getting More WATER for the WELLS



The laboratory of the Ground Water Research Center at Fresno, Calif., is being used in the artificial recharge program. N-45189

The Story of Artificial Ground Water Recharge Projects



The selection of an infiltration, or recharging, site depends upon underground formations. Recharged water must reach the water-bearing strata to benefit the wells. Recharging over an impervious layer results in "perched" water of no benefit to the water bearing formation. BN-7959

Runoff water that accumulates in an estimated 37,000 playas, or natural shallow pools, in the High Plains, is available for artificial recharge. Normally little infiltrates, much evaporates. BN-18053X

One of the best means of obtaining water for agricultural, industrial, and domestic use is by sinking wells into vast underground reservoirs. However, modern demands for water are draining these reservoirs faster than nature replenishes them. As the water table sinks, wells have to go deeper, pumps have to be more powerful, and water becomes a more expensive item in everybody's budget.

As part of its soil and water research program, the Agricultural Research Service set up centers in California, Texas and Arizona to study methods of artificial replenishment of these underground reservoirs. This research is in cooperation with state agricultural experiment stations or other state agencies concerned with water resources. The three states chosen for the projects are the largest volume users of ground water in the Nation.

Much of the surface water present during wet seasons is lost by runoff to the sea or by evaporation to the atmosphere. The problem is to find inexpensive and effective means of getting this water to infiltrate, or seep underground, where it could be pumped to the surface again for use during water-short periods. Artificial recharge augments natural recharge in three ways: increasing the infiltration rate, placing water in the most effective areas for infiltration, and increasing the length of time water is present in these areas.

Scientists are working to improve the processes used to get water underground. Methods of removing sediment and other pollutants from recharge water are being developed. They are also finding ways to use water from such sources as effluents from sewage treatment plants and drainage systems, and excess irrigation water, for artificial recharge.

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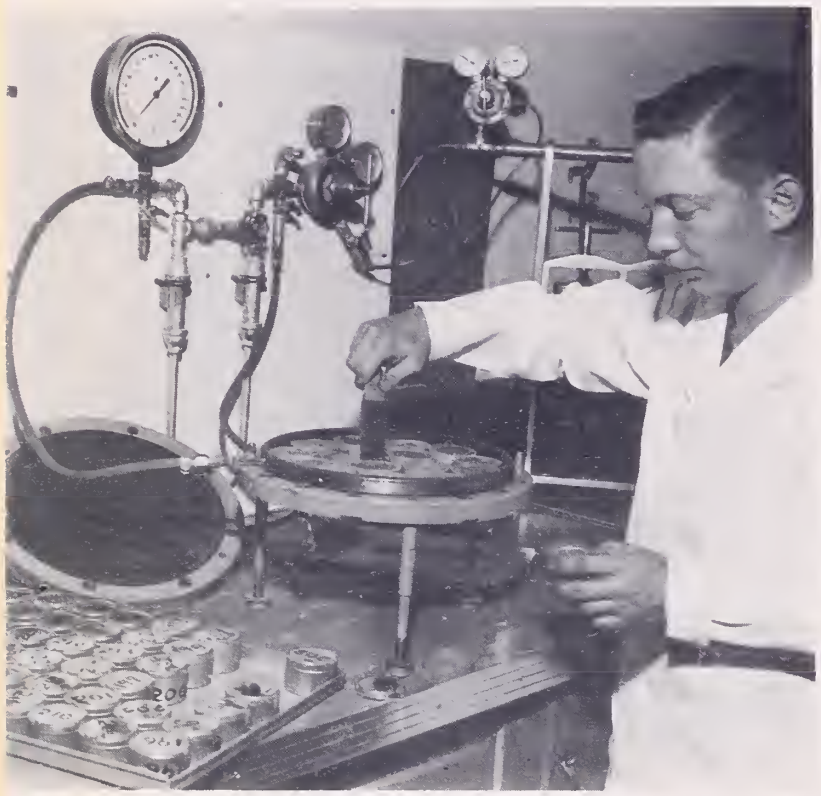
Hydraulic conductivity and water transmission of soil is studied in the laboratory of the Ground Water Recharge Center at Fresno by Mr. Leonard Schiff, Hydraulic Engineer. Mr. Schiff is in charge of the Fresno Center. N-45173

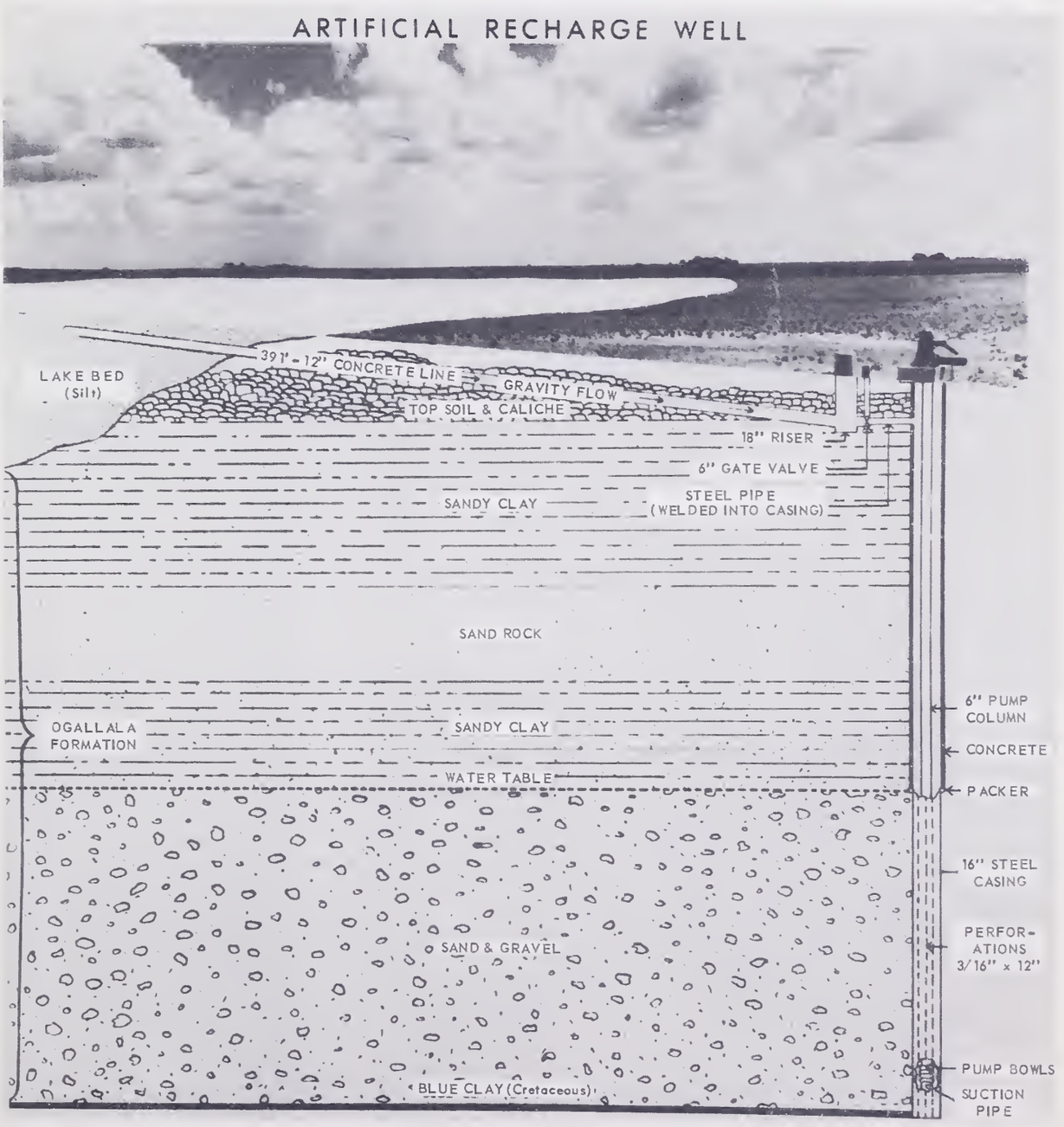


A pressure membrance apparatus is used to determine soil moisture characteristics associated with moisture movements in soils. These are two of a number of scientific devices being used by ARS researchers in the artificial ground water recharge program. N-45166

When recharge is accomplished by injecting water into a well, either one designed for recharge, or a multi-purpose type, it is recommended that the well be pumped out every 24 hours to prevent sediment from clogging it. This well is being pumped near the Bushland, Texas, lab. BN-18050X

Another approach to the problem of sediment clogging recharge areas is aerial application of a synthetic flocculent to the lake water to be recharged. The flocculent causes clumping and settling of sediment before the water flows to the recharge site.

BN-18052X

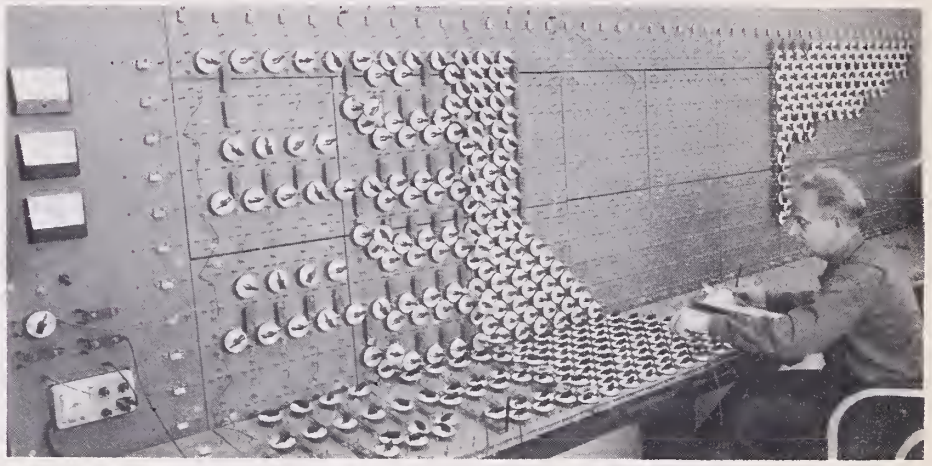


One method of recharge is by multiple purpose wells. When the lake rises in wet weather, the valve in the underground pipeline is opened and water flows through the pipeline and down the well between the column pipe and casing into the water-bearing formation. During dry periods, the well supplies irrigation water.

BN-18047X

Another way to recharge is to divert water from rivers into basins to infiltrate into underground reservoirs. The man (inset) is taking information from a meter that records the amount of water going into a water-spreading plot at this recharge basin near Bakersfield, California. N-45182, BN-18051X

Different methods of filtering water to be recharged is studied by the research centers. The filtered water from the round conduit is directed into a model recharge well at Fresno. The water used to keep the filtering bed open is discharged into a pit in the foreground. BN-18049X



Dr. Herman Bouwer uses a resistance network analog, an electrical device which simulates the flow of water in the soil, to study movement of water from the recharge site to the ground water reservoir, at the Tempe Laboratory. N-44160

Movement of soil moisture beneath a recharge basin is checked by these men using a neutron moisture meter. N-45187